

What is claimed is:

[Claim 1] 1. A method of double-sided etching, comprising:
providing a wafer comprising at least a first region and at least a second region, an area of the first region being smaller than an area of the second region, and the second region being partially overlapped with the first region;
performing a first photo-etching process (PEP) upon a first surface of the wafer to remove the wafer in the first region until a predetermined depth;
bonding the first surface of the wafer to a carrier; and
performing a second photo-etching process upon a second surface of the wafer to remove a portion of the wafer in the second region not overlapped with the first region until the wafer is etched through.

[Claim 2] 2. The method of claim 1, wherein the first region and the second region define a micro spindle structure.

[Claim 3] 3. The method of claim 1, wherein the first photo-etching process comprises:
forming a first photo resist pattern exposing the first region on the first surface of the wafer;
etching the wafer not covered by the first photo resist pattern until the predetermined depth, the predetermined depth being larger than a sum of a deviation of the second photo-etching process and a deviation of a thickness of the wafer; and
removing the first photo resist pattern.

[Claim 4] 4. The method of claim 1, wherein the first surface of the wafer is bonded to the carrier with a bonding layer.

[Claim 5] 5. The method of claim 1, wherein the second photo-etching process comprises:

forming a second photo resist pattern exposing the second region not overlapped with the first region;
etching through the wafer not covered by the second photo resist pattern until the bonding layer; and
removing the second photo resist pattern.

[Claim 6] 6. The method of claim 1, further comprising performing the step of removing the bonding layer after the second photo-etching process.

[Claim 7] 7. A method of forming a micro spindle, comprising:
providing a wafer comprising at least a spindle region and two through regions, the two through regions being respectively positioned on both sides of the spindle region;
partially removing the wafer in the spindle region from a first surface of the wafer; and
removing the wafer in the two through regions from a second surface of the wafer until the wafer is removed through to the first surface.

[Claim 8] 8. The method of claim 7, wherein the wafer in the spindle region is removed by etching.

[Claim 9] 9. The method of claim 7, wherein the wafer in the two through regions are removed by etching.

[Claim 10] 10. The method of claim 7, wherein the first surface of the wafer is bonded to a carrier with a bonding layer while removing the wafer in the two through regions.

[Claim 11] 11. The method of claim 10, further comprising the step of removing the bonding layer after the wafer in the two through regions is removed.